FIG. 1

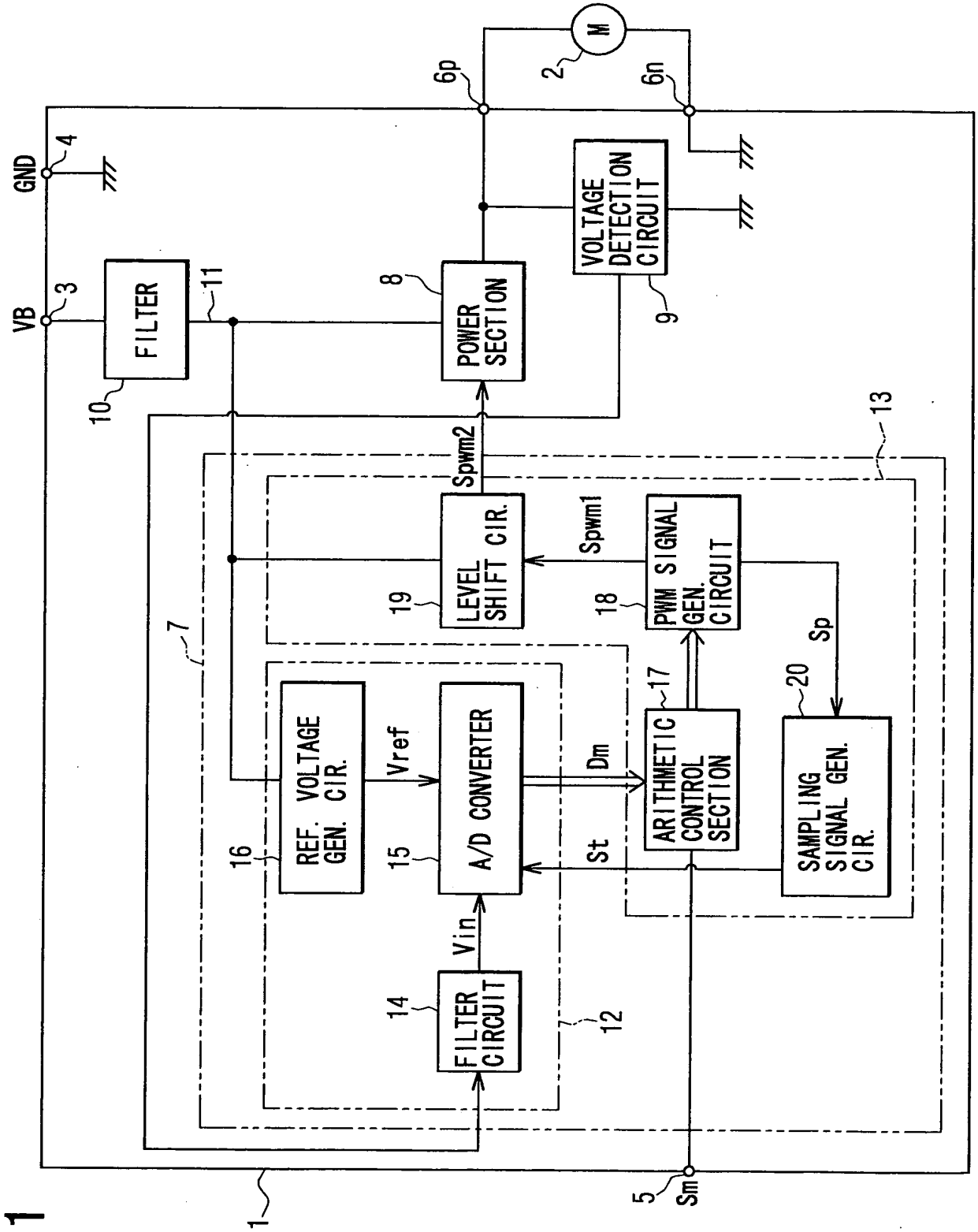

M
2
6p
6n
GND
4
VB
3
FILTER
11
10
POWER SECTION
8
VOLTAGE DETECTION CIRCUIT
9
13
Spwm2
Spwm1
LEVEL SHIFT CIR.
19
PWM SIGNAL GEN. CIRCUIT
18
7
Sp
17
20
REF. VOLTAGE GEN. CIR.
16
Vref
A/D CONVERTER
15
Dm
St
ARITHMETIC CONTROL SECTION
SAMPLING SIGNAL GEN. CIR.
Vin
FILTER CIRCUIT
14
12
1
5
Sm

FIG. 2

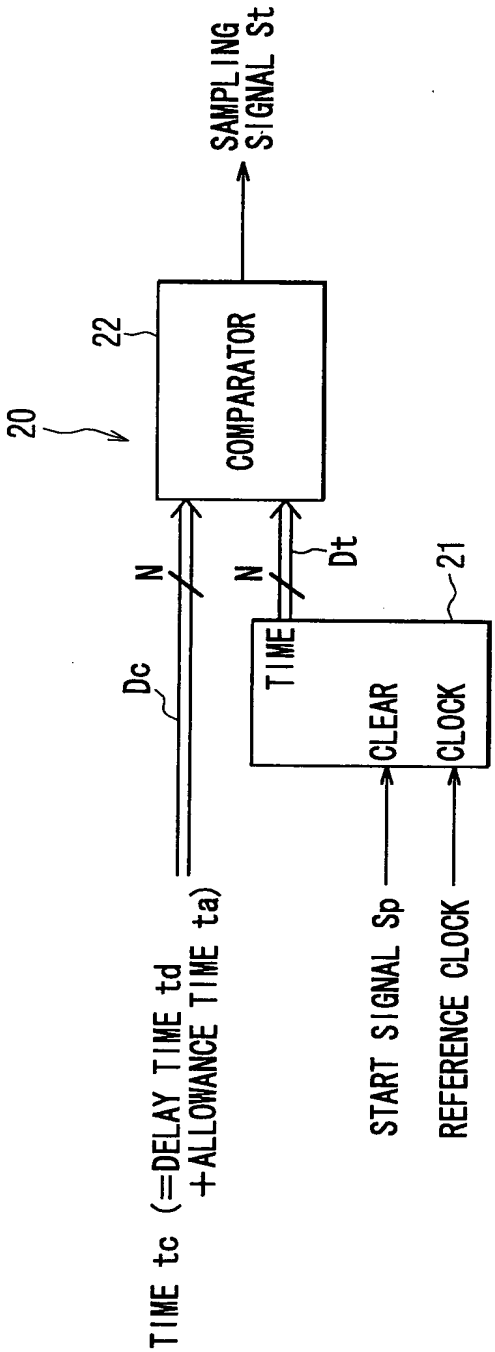

20
22
COMPARATOR
SAMPLING SIGNAL St
N
N
Dc
Dt
TIME
21
CLEAR
CLOCK
TIME tc (=DELAY TIME td +ALLOWANCE TIME ta)
START SIGNAL Sp
REFERENCE CLOCK

FIG. 3A

FIG. 3B

FIG. 3C

FIG. 3D

FIG. 3E

FIG. 3F

FIG. 3G

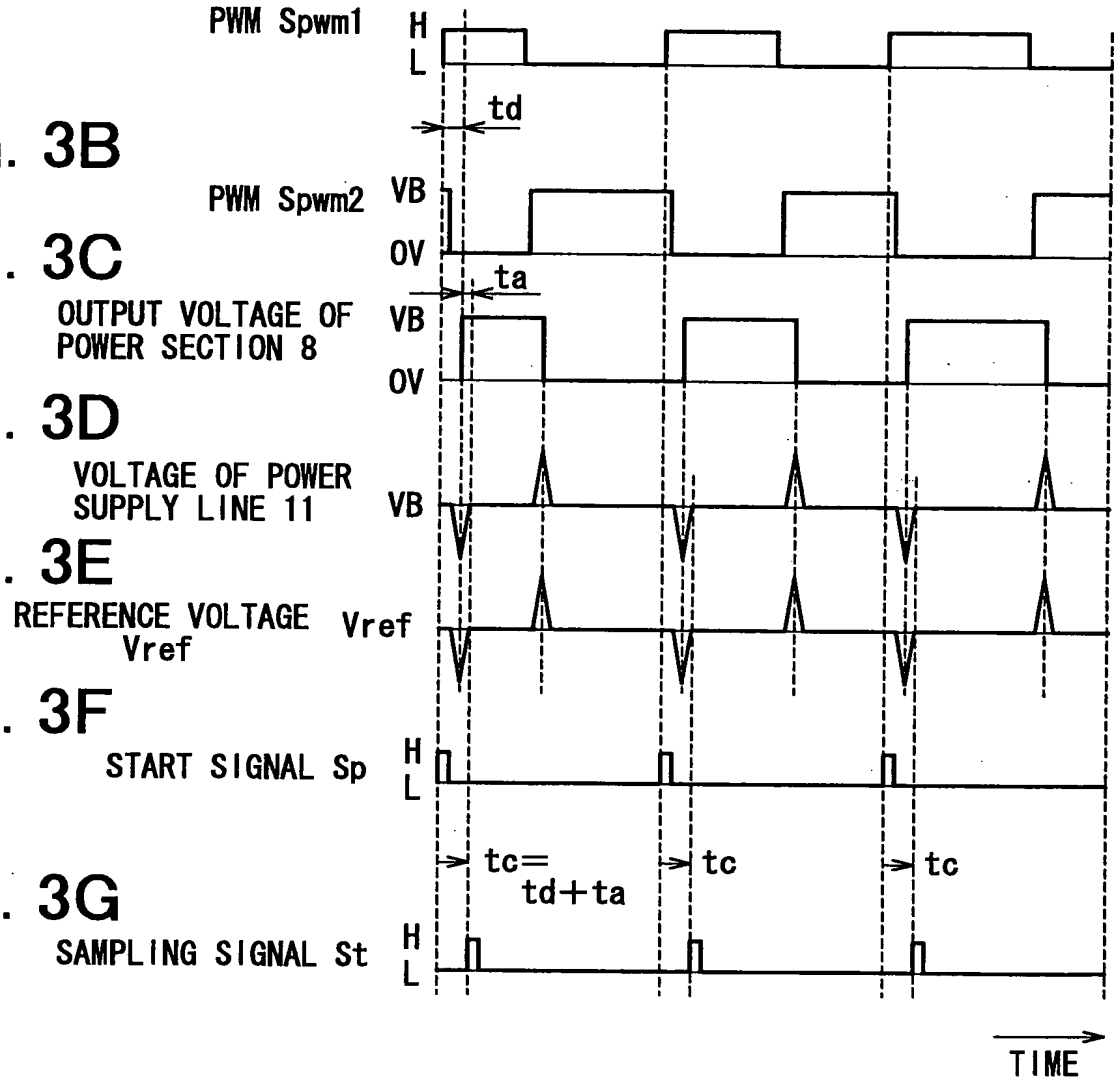


FIG. 4

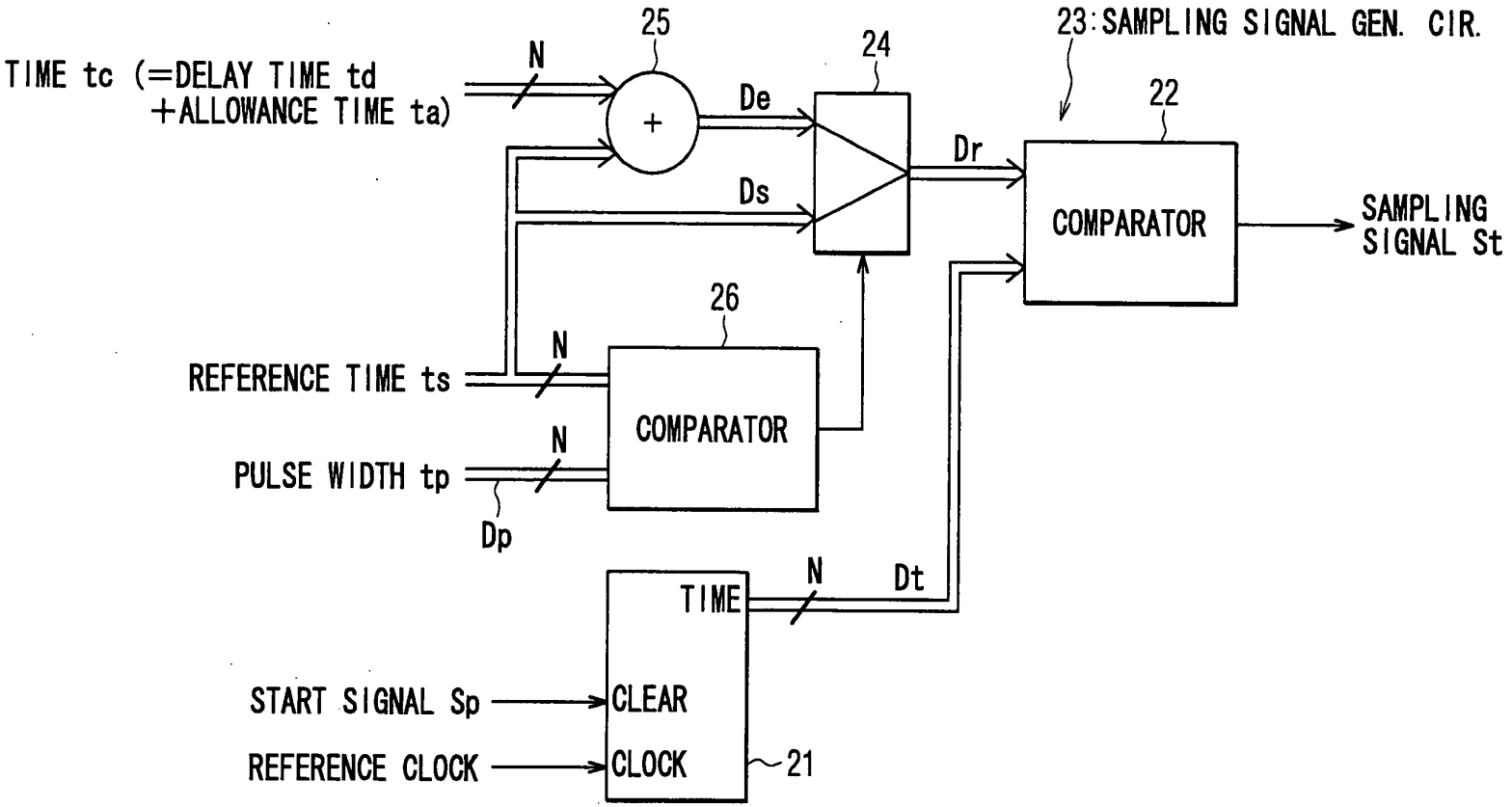

TIME tc (=DELAY TIME td
+ALLOWANCE TIME ta)
N
25
+
De
Ds
24
23:SAMPLING SIGNAL GEN. CIR.
22
Dr
COMPARATOR
SAMPLING
SIGNAL St
26
REFERENCE TIME ts
N
COMPARATOR
PULSE WIDTH tp
N
Dp
TIME
N
Dt
START SIGNAL Sp
CLEAR
REFERENCE CLOCK
CLOCK
21

FIG. 5A

FIG. 5B

FIG. 5C

FIG. 5D

FIG. 5E

FIG. 5F

FIG. 5G

FIG. 5H

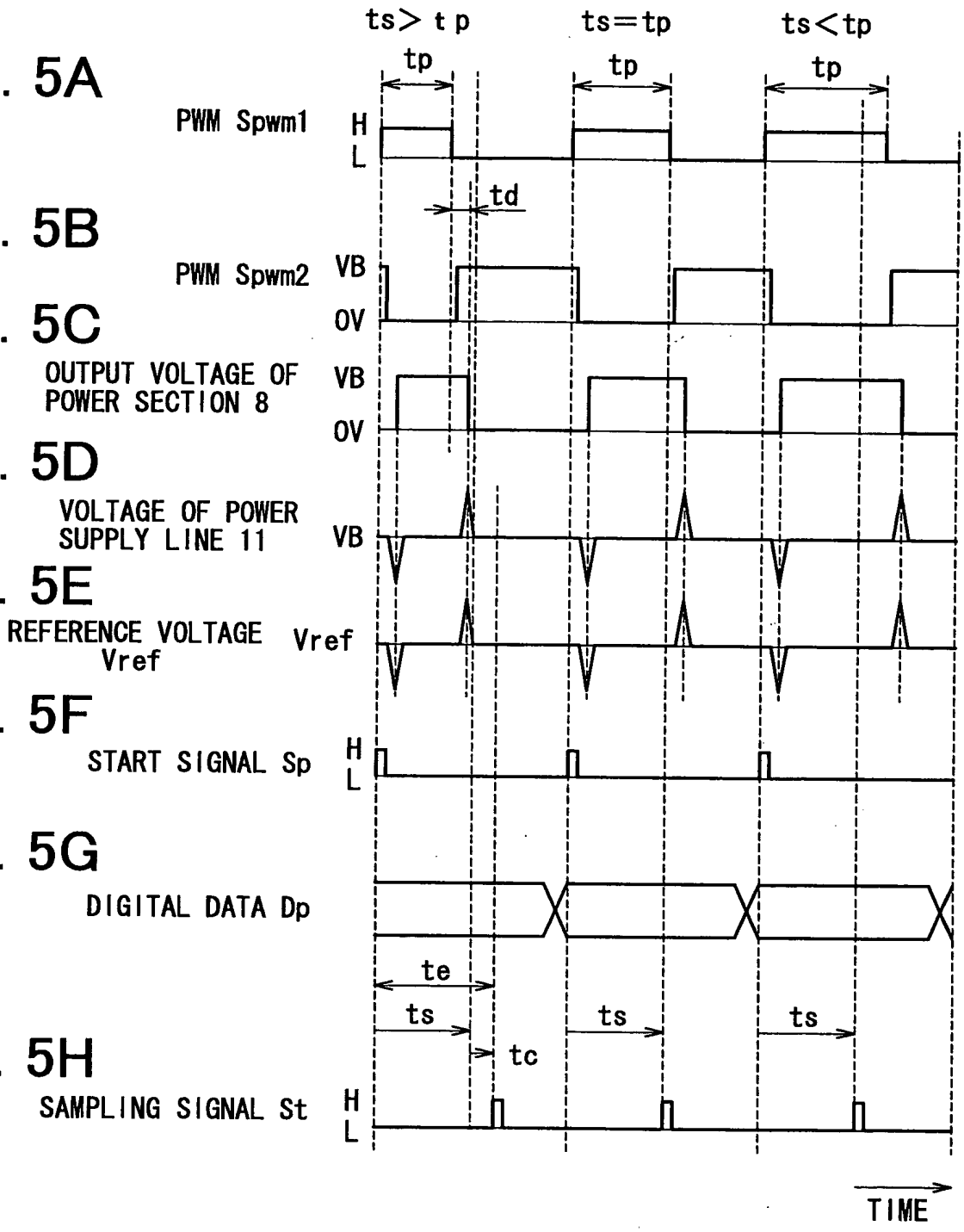


FIG. 6A

FIG. 6B

FIG. 6C

FIG. 6D

FIG. 6E

FIG. 6F

FIG. 6G

FIG. 6H

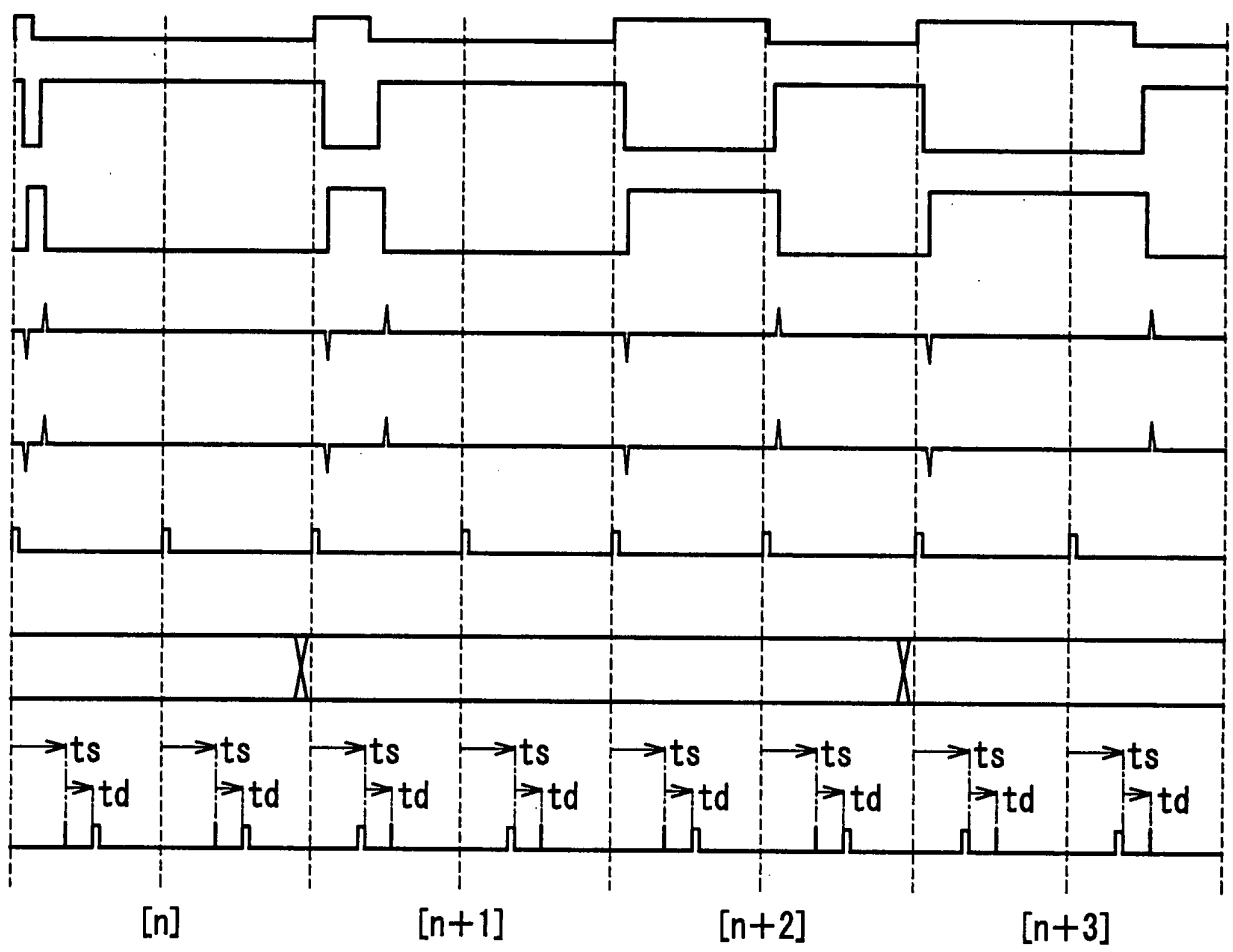
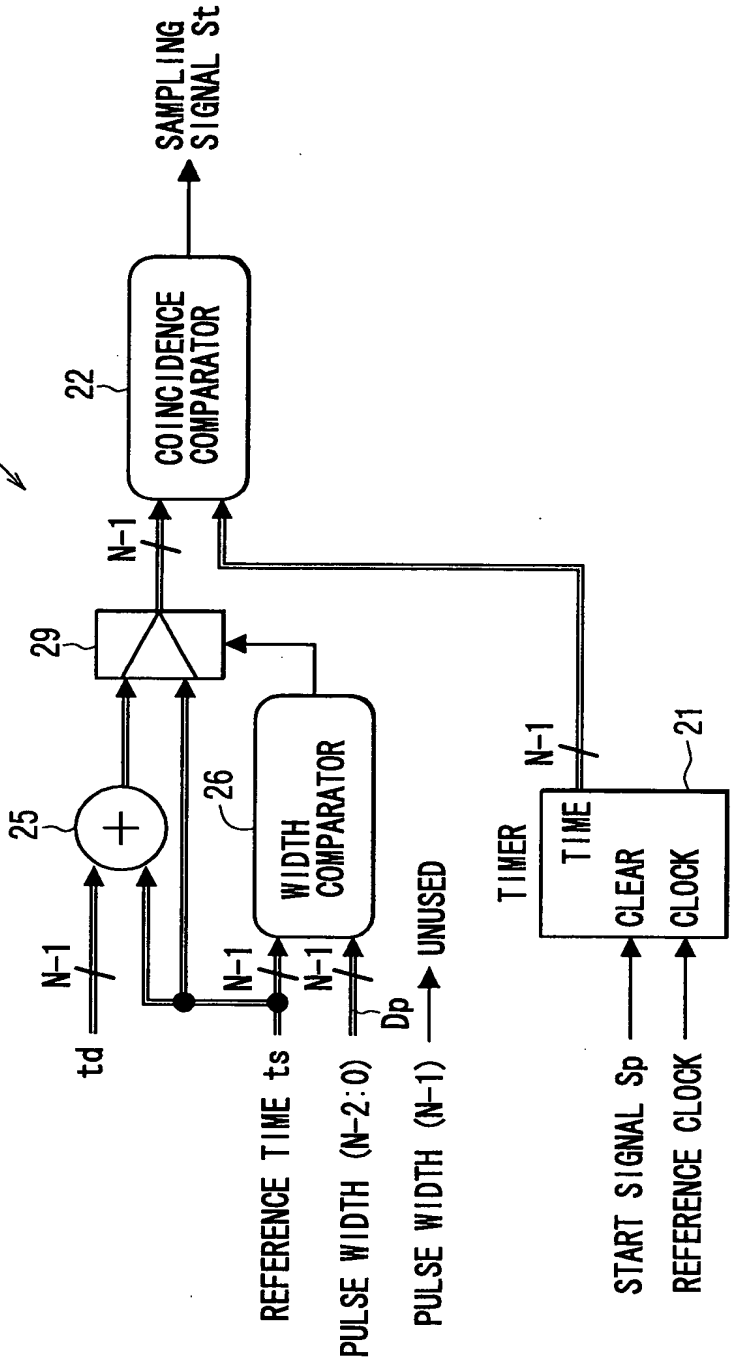


FIG. 7


23'
22
COINCIDENCE COMPARATOR
SAMPLING SIGNAL St
N-1
29
25
26
WIDTH COMPARATOR
TIMER
TIME
CLEAR
CLOCK
21
N-1
td
REFERENCE TIME ts
PULSE WIDTH (N-2:0)
Dp
UNUSED
PULSE WIDTH (N-1)
START SIGNAL Sp
REFERENCE CLOCK